### PATENT COOPERATION TREATY

## **PCT**

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PA1770WO			FOR FURTHER A	ACTION	See Form PCT/IPEA/416			
International application No. International			International filing da	ate (day/month/year)	Priority date (day/month/year)			
			24.08.200	14	29.08.2003			
International Patent Classification (IPC) or national classification and IPC  B81B3/00								
Applicant COMMISSARIAT A L'ENERGIE ATOMIQUE								
1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.								
2. This REPORT consists of a total of 6 sheets, including this cover sheet.								
3. This report is also accompanied by ANNEXES, comprising:								
a. 🔀	(sent to the a	pplicant and	to the International Bi	ureau) a total of 3	sheets, as follows:			
	sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).							
	sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.							
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, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).								
4. This rep	ort contains indi	cations relation	ng to the following iten	ms:				
	Box No. I	Basis of the	report					
	Box No. II	Priority						
	Box No. III	Non-establis	shment of opinion with	n regard to novelty, invent	ive step and industrial applicability			
	Box No. IV	Lack of unit	y of invention					
	Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement							
	Box No. VI Certain documents cited							
	Box No. VII	Certain defe	cts in the international	l application				
	Box No. VIII Certain observations on the international application							
Date of submission of the demand Dat				Date of completion of thi	is report			
	- I die Genam							
Name and mailing address of the IPEA/EP				Authorized officer				
Facsimile No.				Telephone No.				

Translation

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/FR2004/002184

Box	No. I	Basis of the report	101111					
1.		d to the language, this report is based on the internation	nal application in the language in	which it was filed, unless otherwise				
	This report is based on translations from the original language into the following language which is the language of a translation furnished for the purposes of:							
	H	international search (Rule 12.3 and 23.1(b)) publication of the international application (Rule 12.4	`					
	Ħ	international preliminary examination (Rule 55.2 and						
2.	this report	d to the elements of the international application, this Office in response to an invitation under Article 14 ar	report is based on (replacement s	sheets which have been furnished to the riginally filed" and are not annexed to				
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	page	Ī. ————————————————————————————————————						
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	the c	claims:						
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	nos.	• 1-10	received by this Authority on	of 11.04.2005				
	nos.	*	received by this Authority on					
*	the c	drawings:						
	shee	ts 1/6-6/6		as originally filed/furnished				
	shee	ts*	received by this Authority on					
	shee	ts*	received by this Authority on					
		quence listing and/or any related table(s) – see Supplen		isting.				
١.			,	<b>b</b>				
3.	L The	amendments have resulted in the cancellation of:						
	님	the description, pages						
}	닏	the claims, nos.						
		the drawings, sheets/figs	<u> </u>					
	닏	the sequence listing (specify):		<del></del>				
		any table(s) related to sequence listing (specify):						
4.	This they	report has been established as if (some of) the amend have been considered to go beyond the disclosure as f	dments annexed to this report and the supplemental and the supplemental and the supplemental areas and the supplemental areas and the supplemental areas are supplemental areas are supplemental areas and the supplemental areas are supplemental are supplemental areas are suppleme	I listed below had not been made, since ntal Box (Rule 70.2(c)).				
		the description, pages						
		the claims, nos.						
		the drawings, sheets/figs						
		the sequence listing (specify):						
		any table(s) related to sequence listing (specify):						
	If item 4 a	applies, some or all of those sheets may be marked "sup						

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Box	No. V Reasoned staten citations and ex	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement				
1.	Statement					
	Novelty (N)	Claims	1-10	YES		
		Claims		NO		
	Inventive step (IS)	Claims	2-6, 8, 9	YES		
		Claims	1, 7, 10	NO		
	Industrial applicability (IA)	Claims	1-10	YES		
		Claims		NO		
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- 2. Citations and explanations (Rule 70.7)
  - The following documents are mentioned in the present report; the numbering given below will be used throughout the rest of the procedure:

D1: US-A-5334342

D2: US-A-6277756

D3: WO-A-0109579\*

- \* D3 is cited in the international search report.
- 2. The present application fails to meet the requirements of PCT Article 33(1), since the subject matter of claims 1 and 7 does not involve an inventive step as defined by PCT Article 33(3).
- 2.1 D1, which is considered to be the prior art closest to the subject matter of claim 1, describes (cf. in particular figure 6L and the corresponding text and column 8, lines 40 to 59) a micromechanical device comprising in combination all the technical features of claim 1. The micromechanical device (cf. figure 6L) comprises at least one suspended element (80) attached to a substrate (62) by a pillar having a base and a

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

top (cf. "central hub" 80). The substrate comprises a recess etched into a substrate and opening onto the surface of the substrate opposite the suspended element (cf. the recess created by etching: column 9, lines 48 to 52 and figure 6G); said recess has at least one broadened area of which the cross-section is greater than that of the recess at said surface; the base of the pillar, shaped to match the recess, is embedded therein (cf. figure 6L).

Consequently, the subject matter of claim 1 differs from this known device in that at least two broadened areas of the recess consist of at least two vertically adjacent grooves and the base of the pillar comprises at least two ribs matching said grooves.

The problem that the present invention is intended to solve can therefore be considered to be that of producing an alternative recess to the one described in D1. This feature is merely one of several obvious options that a person skilled in the art seeking to solve the stated problem might select, depending on each particular case, and without an inventive step being involved (cf. D2, figures 7A to 7I: a recess is formed with grooves). A person skilled in the art might select the recess described in D2, for example, to provide a more stable anchoring area than the one described in D1.

2.2 Claim 7 differs from the original claim 9 (cf. claim 1 paragraphs 2.2) in that the grooves are produced by alternating steps of C4F8 passivation and SF6 etching.

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

These additional features are known from D2 (cf. column 7, lines 12 to 29) and therefore do not confer inventiveness on claim 7

2.3 Furthermore, claims 1 and 7 do not involve an inventive step relative to D3 and D2.

D3 describes (cf. in particular figures 14a to 14h and the corresponding text) a micromechanical device (cf. figure 14h) comprising at least one suspended element (378) attached to a substrate (350) by a pillar (371) having a base and a top. The substrate comprises a recess (370) etched into a substrate and opening onto the surface of the substrate opposite the suspended element; the base of the pillar, shaped to match the recess, is embedded therein (cf. figure 14h).

Consequently, the subject matter of claim 1 differs from this known device in that:

- (i) the recess has at least one broadened area of which the cross-section is greater than that of the recess at said surface;
- (ii) at least two broadened areas of the recess consist of at least two vertically adjacent grooves and the base of the pillar comprises at least two ribs matching said grooves.

The problem that the present invention is intended to solve can be considered to be that of providing an alternative deep recess to the one described in D1. This feature is merely one of several obvious options that a person skilled in the art seeking to solve the

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

stated problem might select, depending on each particular case, and without an inventive step being involved (cf. D2, figures 7A to 7I: a recess is formed with grooves). A person skilled in the art might select the recess in D2, for example, to provide a deeper recess than the one described in D3. The method of D2 produces a recess with grooves and ribs and the oxide film does not have the effect of smoothing the walls of the recess.

Claim 7 describes well-known steps for producing the micromechanical device according to claim 1 and does not therefore involve an inventive step.

3. Claims 2 to 6, 8 and 9 meet the requirement of novelty, involve an inventive step and are industrially applicable (PCT Article 33).